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10/010,774	11/13/2001	Baoqing Ye	Verizon-18	2755

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EXAMINER	
JUNTIMA, NITTAYA	

ART UNIT	PAPER NUMBER
2616	

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,774	YE, BAOQING	
	Examiner	Art Unit	
	Nittaya Juntima	2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *1,2 and 7* is/are ~~withdrawn from consideration.~~ cancelled.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-6,8, 10-16 and 18* is/are rejected.

7)☒ Claim(s) *9,17 and 19-23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on 1/3/2006.

2. The objections to the specification are withdrawn in view of applicant's amendment.

3. Claims 1, 2, and 7 are cancelled.

4. Claims 4, 5, 10, 11, 12, 14, 16, and 18 are rejected under 102(e).

5. Claims 3, 6, 8, 13, and 15 are rejected under 103 (a).

6. Claims 9, 17, and 19-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Objections

7. Claims 4, 10, 13, and 19 are objected to because of the following informalities:

- in claim 4, line 5, "steps" should be changed to "step;"

  line 7, a comma should be changed to a semicolon;

- in claim 10, line 2, "destination node" should be changed to "destination device," see line 3 of claim 10 and line 7 of claim 13;

- in claim 13, line 4, "the second node" should be inserted following "that";

- in claim 19, line 5, "paths" should be changed to "path."

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 4, 5, 10, 11, 12, 14, 16, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishihara (USPN 6,424,620 B1).

Regarding claim 4, Nishihara teaches a packet flow control method comprising the steps of:

Detecting congestion (col. 9, lines 41-47) in a first node (24 in Fig. 1) along a packet flow path between a source device (21 in Fig. 1) and a destination device (22 in Fig. 1), including the step of monitoring to detect when said first node is saturated with packet traffic for a preselected period of time (because (i) the RM and BRM packets are transferred periodically, col. 9, lines 26-30, (ii) the condition to detect the outside blocking/congestion is expressed by formula (1), col. 8, lines 19-55, (iii) the destination node 24 uses the average flowing speed contained in the periodic RM to judge whether there is a congestion and notifies the source node 23 of the congestion or lack thereof and the permissible average flowing speed, col. 9, lines 41-47 and col. 11, lines 62-col. 12, lines 13 and 26-30, (iv) the source node 23 then controls the average speed according to the notice, col. 9, lines 47-52, therefore, when the condition in formula (1) is true, node 24 must detect the congestion/outside blocking at node 24 and the congestion would continue for a pre-selected period until the condition in formula (1) is no longer true, i.e. congestion no longer exists. See also the teaching on this by Nakamura et al. (USPN 6,463,036

B2) in col. 1, lines 57-col. 2, lines 7. Therefore, it is inherent that node 24 must detect when the node is congested with cell traffic for a pre-selected period of time).

Identifying a node (23 in Fig. 1) in said path preceding said first node (node 24 must identify node 23 from the source edge address contained in the received RM packet, col. 9, lines 26-27 and col. 10, lines 1-6).

Transmitting to said preceding node (23 in Fig. 1) a traffic regulation signal (BRM packet) used to initiate flow rate control on flows (the permissible average flowing speed) identified from information included in said traffic regulation signal, wherein said information included in said traffic regulation signal includes a destination address (46, Fig. 5). See col. 9, lines 47-50 and col. 10, lines 19-36.

Regarding claim 5, Nishihara teaches that said traffic regulation signal (BRM packet) includes flow path information (payload 44 in Fig. 5, col. 10, lines 19-36).

Regarding claim 10, Nishihara teaches a method of implementing flow control in a communications network including a first node (23 in Fig. 1), a second node (24 in Fig. 1), and a destination device (22 in Fig. 1), the first being located upstream of the second node on a communication path (see Fig. 1) to said destination device, to method comprising the steps of:

Operating the second node (24 in Fig. 1) to detect when the second node is saturated with traffic for a period of time (because (i) the RM and BRM packets are transferred periodically, col. 9, lines 26-30, (ii) the condition to detect the outside blocking/congestion is expressed by formula (1), col. 8, lines 19-55, (iii) the destination node 24 uses the average flowing speed contained in the periodic RM to judge whether there is a congestion and generates the BRM packet in response, col. 9, lines 41-47 and col. 11, lines 62-col. 12, lines 13 and 26-30, therefore,

when the condition in formula (1) is true, node 24 must detect the occurrence of the congestion/outside blocking at the node and the node would still be congested when the BRM is generated. In other words, the period of time reads on the period when node 24 detects the congestion/outside blocking to the time node 24 generates the BRM packet in response to congestion detection.

In response to detecting that said second node is saturated with traffic for said period of time, operating the second node to send a first traffic regulation signal (the BRM packet) to the first node to trigger said first node to perform traffic regulation of flow rates on flows of packets directed to said destination device. See col. 9, lines 47-62 and col. 12, lines 26-34.

Regarding claim 11, Nishihara teaches that a BRM packet is returned to the source node 23 as a reply packet of the RM packet, col. 9, lines 26-30, and the BRM packet includes the addresses of source node 23 and destination node 24 as shown in Fig. 5, col. 10, lines 19-27. Therefore, it is inherent that the step of initiating a path determination operation to determine at least a portion (source and destination) of a path of a flow causing congestion at said second node (node 24) must be included in order for the BRM packet to be returned correctly to the source node 23.

Regarding claim 12, Nishihara teaches operating the second node (24 in Fig. 1) to receive path information (source and destination addresses) identifying the first node (23 in Fig. 1) as part of the path of the flow causing congestion (the node 24 receives the RM packet which includes the addresses of source node 23 and destination node 24 as shown in Fig. 4, col. 10, lines 1-8).

Regarding claim 14, Nishihara further teaches operating the preceding node (23 in Fig. 1), in response to said first traffic regulation message (BRM packet), to perform a forced reduction in the flow rate of at least one packet flow in response to detecting traffic congestion (col. 9, lines 47-52).

Regarding claim 16, Nishihara teaches comparing packet flow rates of packet flows directed to the destination (22 in Fig. 1) to at least one flow rate baseline (the permissible flowing speed) for said first node (col. 10, lines 51-57), and dropping packets from packet flows directed to the destination which have flow rates exceeding the flow rate base line to which the particular flow rate is compared (the traffic beyond the permissible flowing speed will be abandoned, col. 10, lines 51-59).

Regarding claim 18, Nishihara teaches a communication system for communicating information as flows of packets, the system comprising:

A first network node (24 in Fig. 1) including:

i. Congestion control means (the permissible flowing speed judging unit 77 in Fig. 7) for detecting congestion at said first network node (col. 7, lines 56-61 and col. 12, lines 7-13).

ii. Traffic flow path determination means for determining the path at least one packet flow causing congestion at said first network node (determining method is not defined, therefore the traffic flow path determination means reads on the BRM packet inserting unit 78 in Fig. 4 which must determine the path of the flow between the source node 23 and the destination node 24 in order to correctly return the BRM packet to the source node 23 according to the destination information, i.e. via the respective node devices 25-N, ...25-1, col. 12, lines 26-30, see also col. 9, lines 26-33).

iii. Early traffic regulation signaling means (the BRM packet inserting unit 78 in Fig. 4) for transmitting a traffic regulation signal (BRM packet) to initiate traffic regulation at an upstream network node (23 in Fig. 1). See col. 12, lines 26-34 and col. 10, lines 43-46 and 51-57.

An upstream network node (23 in Fig. 1) being coupled to the first network node (24 in Fig. 1), the upstream network node including:

i. Means (the BRM packet detecting unit 64 in Fig. 6) for receiving traffic regulation signals (col. 9, lines 26-30, col. 10, lines 44-50, and col. 11, lines 28-36).

ii. Flow control means (the average flowing speed control unit 61 in Fig. 6) for performing flow rate reduction operations on one or more traffic flows identified from information included in received traffic flow control messages (col. 9, lines 26-30 and col. 10, lines 51-59).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara (USPN 6,424,620 B1) in view of an art of record, "*ICMP Traceback Messages*" by Bellovin and Leech AT&T Labs Research (hereafter "Bellovin").

Regarding claim 3, Nishihara teaches a packet flow control method comprising the steps of:

Detecting congestion (col. 9, lines 41-47) in a first node (24 in Fig. 1) along a packet flow path between a source device (21 in Fig. 1) and a destination device (22 in Fig. 1), including the step of monitoring to detect when said first node is saturated with packet traffic for a preselected period of time (because (i) the RM and BRM packets are transferred periodically, col. 9, lines 26-30, (ii) the condition to detect the outside blocking/congestion is expressed by formula (1), col. 8, lines 19-55, (iii) the destination node 24 uses the average flowing speed contained in the periodic RM to judge whether there is a congestion and notifies the source node 23 of the congestion or lack thereof and the permissible average flowing speed, col. 9, lines 41-47 and col. 11, lines 62-col. 12, lines 13 and 26-30, (iv) the source node 23 then controls the average speed according to the notice, col. 9, lines 47-52, therefore, when the condition in formula (1) is true, node 24 must detect the congestion/outside blocking at node 24 and the congestion would continue for a pre-selected period until the condition in formula (1) is no longer true, i.e. congestion no longer exists. See also the teaching on this by Nakamura et al. (USPN 6,463,036 B2) in col. 1, lines 57-col. 2, lines 7. Therefore, it is inherent that node 24 must detect when the node is congested with cell traffic for a pre-selected period of time).

Transmitting to said preceding node (23 in Fig. 1) a traffic regulation signal (BRM packet) used to initiate flow rate control on flows (the permissible average flowing speed) identified from information included in said traffic regulation signal, wherein said information included in said traffic regulation signal includes a destination address (46, Fig. 5). See col. 9, lines 47-50 and col. 10, lines 19-36.

However, Nishihara fails to teach identifying a node in said path preceding said first node which includes transmitting a signal to the destination device requesting path information.

Bellovin teaches using an ICMP Traceback message transmitted by a router (equivalent to the first node) along the path to the destination (equivalent to the destination device) in order to determine the traffic source and path during a denial-of-service attack. See section 2. Abstract.

Since Nishihara further teaches that the first node 24 is a destination edge device 22 connecting to a destination user LAN 22 as shown in Fig. 1, it must have an IP-ATM conversion capability (see also col. 15, lines 52-65). Therefore, given the teaching of Bellovin on the ICMP Traceback message, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of Nishihara to include identifying a node (the source) in said path preceding said first node which includes transmitting a signal (an ICMP Traceback message) to the destination device requesting path information. The motivation/suggestion to do so would have enable the node originating the signal, i.e. the ICMP Traceback message, to determine the traffic source and path when dealing with denial-of-service attack as taught by Bellovin (section 2, Abstract, lines 1-2).

12. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara (USPN 6,424,620 B1) in view of Ogawa et al. ("Ogawa") (USPN 6,208,653 B1).

Regarding claims 6 and 15, although Nishihara teaches the preceding node (23 in Fig. 1) an additional preceding node (21 in Fig. 1), Nishihara fails to explicitly teach operating the preceding/first node to transmit an additional/a third traffic regulation signal to an additional preceding node/a node located upstream of said first node to cause the additional preceding

node/the upstream node to initiate flow rate control on flows directed to a destination address identified in said additional/third traffic regulation signal.

However, Ogawa teaches operating a preceding node/first node (2 in Fig. 1) to transmit an additional/third traffic regulation signal (ACK packet) to an additional preceding node/an upstream node (1 in Fig. 1) to cause the additional preceding node/upstream node to initiate flow rate control on flows directed to a destination address identified in said additional/third traffic regulation signal (the ACK generated by gateway 2 indicates that the receiving terminal 5 in Fig. 1 cannot receive the data, col. 3, lines 4-14 and col. 6, lines 49-56).

Given the teaching of Ogawa, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of Nishihara to include operating the preceding node/first node to transmit an additional/a third traffic regulation signal to an additional preceding node/upstream node to cause the additional preceding node/upstream node to initiate flow rate control on flows directed to a destination address identified in said additional/third traffic regulation signal as recited in the claim. The suggestion/motivation to do so would have been to increase a network throughput by stopping the transmission of a TCP datagram from the transmitting terminal itself as taught by Ogawa (col. 8, lines 3-13).

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara (USPN 6,424,620 B1) in view of Bleiweiss et al. ("Bleiweiss") (USPN 6,144,714).

Regarding claim 8, Nishihara teaches a packet flow control method comprising the steps of:

Detecting congestion (col. 9, lines 41-47) in a first node (24 in Fig. 1) along a packet flow path between a source device (21 in Fig. 1) and a destination device (22 in Fig. 1).

Identifying a node (23 in Fig. 1) in said path preceding said first node (node 24 must identify node 23 from the source edge address contained in the received RM packet, col. 9, lines 26-27 and col. 10, lines 1-6).

Transmitting to said preceding node (23 in Fig. 1) a traffic regulation signal (BRM packet) used to initiate flow rate control on flows (the permissible average flowing speed) identified from information included in said traffic regulation signal, wherein said information included in said traffic regulation signal includes a destination address (46, Fig. 5). See col. 9, lines 47-50 and col. 10, lines 19-36.

Operating the preceding node to perform a forced reduction in the flow rate of at least one packet flow in response to detecting traffic congestion (col. 9, lines 47-52).

However, Nishihara does not teach operating the first node to perform a forced reduction in the flow rate of at least one packet flow in response to detecting traffic congestion.

Bleiweiss teaches that when a node (equivalent to the first node) is congested (detecting traffic congestion), i.e. when it receives far more cells on multiple links (flows) than can be transmitted on one output link, cell(s) may then be discarded (a forced reduction in the flow rate of at least one flow is performed). See col. 2, lines 5-16.

Given the teaching of Bleiweiss, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teaching of Nishihara to include the teaching of Bleiweiss such that operating the preceding node to perform a forced reduction in the flow rate of at least one packet flow in response to detecting traffic congestion would be included as recited in the claim. The suggestion/motivation to do so would have been to reduce latency in delivery of other cells and alleviate the congestion.

14. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara (USPN 6,424,620 B1) in view of Lauffenburger et al. ("Lauffenburger") (USPN 6,657,961 B1).

Regarding claim 13, Nishihara teaches operating the second node (24 in Fig. 1) to detect when the second node ceases to be saturated with traffic after being saturated for said period of time (since the source node 23 would control/adjust the average flowing speed according to the permissible average flowing speed identified in the BRM in response to congestion/outside blocking detected, col. 9, lines 47-52 and col. 12, lines 26-30, and the presence or absence of the congestion is detected using the average flowing speed contained in a periodic RM packet, col. 9, lines 26-30 and 41-47, therefore, once a congestion is detected, node 24 must then detect the end of the congestion/outside blocking following the receipt of subsequent RM packet(s)).

However, Nishihara fails to explicitly teach that in response to the second node detecting that the second node has ceased to be saturated with traffic, sending a second traffic regulation message to said first node to cause said first node to cease traffic regulation of flow rates on flows of packets directed to said destination device.

Lauffenburger teaches in response to a second node (a receiving end station) detecting that the second node has ceased to be saturated with traffic (congestion subsides), sending a second traffic regulation message (solicited RM cell 26 with desired ER value, signaling XON – inherently indicating a stop a previously indicated flow rate) to said first node to cause said first node to cease traffic regulation of flow rates on flows of packets directed to said destination device. See col. 6, lines 25, see also col. 2, lines 41-44.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of Nishihara to include in response to the second node

detecting that the second node has ceased to be saturated with traffic, sending a second traffic regulation message to said first node to cause said first node to cease traffic regulation of flow rates on flows of packets directed to said destination device as recited in the claim. The motivation/suggestion to do so would have been to enable the transmitting end station to restart data flow at a flow rate defined in the returned RM packet as taught by Lauffenburger (col. 6, lines 26-30).

Response to Arguments

15. Applicant's arguments filed 1/3/02006 regarding claims 4, 10, and 18 have been fully considered but they are not persuasive.

A. In the remarks regarding claim 4, applicant argues that a preselected period of time is not taught in Nishihara.

In response, Nishihara teaches that

(i) the RM and BRM packets are transferred periodically, col. 9, lines 26-30,

(ii) the condition to detect the outside blocking/congestion is expressed by formula (1), col. 8, lines 19-55,

(iii) the destination node 24 uses the average flowing speed contained in the periodic RM to judge whether there is a congestion and notifies the source node 23 of the congestion or lack thereof and the permissible average flowing speed, col. 9, lines 41-47 and col. 11, lines 62-col. 12, lines 13 and 26-30,

(iv) the source node 23 then controls the average speed according to the notice, col. 9, lines 47-52.

Therefore, when the condition in formula (1) is true, node 24 must detect the congestion/outside blocking at node 24 and the congestion would continue for a pre-selected period until the condition in formula (1) is no longer true, i.e. congestion no longer exists. The preselected period of time reads on the time when the congestion at node 24 is detected to the time when the congestion no longer exists or origination transmission speed is lowered in order to evade the congestion. See also the teaching on this by Nakamura et al. (USPN 6,463,036 B2) in col. 1, lines 57-col. 2, lines 7.

B. In the remarks regarding claim 10, the applicant argues that the limitation a period of time is not taught by Nishihara.

In response, Nishihara teaches the following:

(i) the RM and BRM packets are transferred periodically, col. 9, lines 26-30,

(ii) the condition to detect the outside blocking/congestion is expressed by formula (1), col. 8, lines 19-55,

(iii) the destination node 24 uses the average flowing speed contained in the periodic RM to judge whether there is a congestion and generates the BRM packet in response, col. 9, lines 41-47 and col. 11, lines 62-col. 12, lines 13 and 26-30.

Therefore, when the condition in formula (1) is true, node 24 must detect the occurrence of the congestion/outside blocking at the node and the node would still be congested when the BRM is generated. The period of time reads on the period when node 24 detects the congestion/outside blocking to the time node 24 generates the BRM packet in response to congestion detection.

C. In the remarks regarding claim 18, the applicant argues that Nishihara does not teach determining the path of the packet flow causing congestion at the first network node.

In response, since path determining method is not defined, determining the path of the flow causing congestion reads on the BRM packet inserting unit 78 in Fig. 4 returning the BRM packet to the source node 23 (on a flow between source node 23 and destination node 24 on which the RM packet was received) according to the destination information, i.e. via the respective node devices 25-N, ..., 25-1. See col. 12, lines 26-30, see also col. 9, lines 26-33.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nittaya Juntima
March 17, 2006

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